To J60

UNION CARBIDE CORPORATION
Engineering, Manufacturing, and Technology Services
Central Engineering

P. O. Box 8361
So. Chas., WV 25303

BUSINESS CONFIDENTIAL

December 22, 1986

TO: See Distribution List

COPY TO: G. E. Garrett
E. V. Lower
L. B. McClung
B. G. Perry
J. E. Sanders

SUBJECT: Position Paper on UNISON Retrofill Technique for PCB Transformers

Current government regulations make it necessary to take some action on transformers in our C&P facilities that contain PCB's above an established level. As you may know, there are several companies that offer services to reclassify these transformers to the non-PCB status (< 50 ppm), and one of these is UNISON, a wholly owned subsidiary of Union Carbide. Which process to select is a question that faces many of you at the present time.

Because there is concern about which process to use, Mr. L. B. McClung, in our Energy Systems Skill Center, has carefully reviewed the UNISON process in comparison with others; and he has authored the attached paper which briefly explains the process, compares it with others, and presents Central Engineering's position on UNISON's technique.

We are sending you a copy of this paper so that you will be aware of some of the considerations that go into selecting the right process, and the fact that Central Engineering accepts the UNISON retrofill technology. We hope this paper will be of value to you, and if we can be of some service in this matter, please feel free to contact Mr. L. B. McClung or me.

Regards,

P. D. Franson

P. D. Franson

PDF:at
Attachment
4499I

UNISON RETROFILL TECHNIQUE FOR RECLASSIFICATION OF PCB TRANSFORMERS AS IT APPLIES TO UNION CARBIDE CORPORATION CHEMICALS AND PLASTICS FACILITIES

UNISON is a wholly-owned subsidiary of Union Carbide Corporation. Its process, developed by targeted research and development programs initiated by the Silicones business group, is a direct result of Chemicals and Plastics' technology. As of October 1986, UNISON has sixteen months commercial experience. Prior to commercialization, UNISON successfully retrofilled four PCB-filled transformers for the South Charleston (West Virginia) Plant.

The UNISON process is based on the premise that it is better to retrofill and reclassify the existing transformer to non-PCB status than it is to replace the transformer. Once completed, such reclassification eliminates short-term (operating) and long-term (landfill) liabilities. Retrofill is certainly valid for those relatively new (eight to twenty year old) transformers or transformers that are in good condition (proven by inspection and tests) that have given reliable service and are located in out-of-the-way or difficult to reach places.

The typical time required to remove PCBs from a PCB-filled transformer is up to eighteen months (twelve to fifteen months for the leaching action and three months for the Environmental Protection Agency reclassification period). During this time, one to four cycles of draining and refilling the transformer with proprietary TF-1 fluid and silicone or mineral oil fluids are required. Each cycle requires an outage of six to twelve hours in duration depending upon the transformer's size and location. PCB transformers with relatively low concentrations (500 to 50,000 parts per million) and PCB contaminated transformers (50-499 parts per million) can be treated with fewer cycles and thus reclassified to non-PCB status much faster. One drain and refill recycle is generally sufficient to enable a PCB-contaminated transformer to be reclassified to non-PCB status (less than 50 parts per million).

The TF-1 fluid is separated from the PCBs in a special process at UNISON's new recovery facility at Henderson, Kentucky. The PCBs are then sent off to one of three approved incineration centers in the United States; UNISON has contracts with all three. The reclassified transformer is left filled with silicone oil, mineral oil, or RTEmp® fluid depending on the customer's request.

Regardless of the extent of the PCB contamination level, with the UNISON technology, the transformer owner typically gains cost advantages. Reclassification offers the choice of capital versus expense financial treatment, while replacement requires the use of capital. Retrofilling results in elimination of the PCB problem. The alternative is replacing the PCB-filled or PCB-contaminated transformer. Replacement typically takes one outage of eight to forty-eight hours in duration. The disadvantage of replacement to the present owner is that he retains title to the contaminated core, coil, and tank which must be properly disposed in an EPA-approved landfill. Even though the transformer is moved off-site, the PCB liability continues with the present transformer owner.

Most Union Carbide facilities are considered to be integrated, continuous process operations. Thus, the disadvantage of the UNISON retrofill process for PCB-filled transformers is the multiple outages. A mitigating factor is that the outages do not have to be on any set schedule. Any one of them can be extended between time to accommodate scheduled maintenance shutdowns, etc. Where it is necessary that Union Carbide have the PCBs removed and disposed of in such a manner that there be no future concern for liability, then UNISON is the only method that we should recognize and accept.

It is the the policy within C&P to absolutely prohibit the landfill disposal of PCB transformers without the specific approval of a Division President or higher authority. Approval is to be granted only if there is no practical alternative to landfill disposal. Our hazardous waste disposal purchasing personnel have experience with indemnification clauses and can provide protective advice when replacement is considered the necessary alternative.

UNISON is the only company that has a recognized process for consistently removing PCBs from PCB-laden transformers. UNISON and others can reclassify PCB-contaminated transformers. Sun-Ohio and S.D. Myers have processes that reclassify transformers provided they have no more than 2,600 parts per million or 3,300 parts per million PBC respectively. Both use closed loop, continuous circulation systems and apply heat plus a reagent to chemically destruct the PCBs in mineral oil. They generate some waste for which they are responsible and which they haul away and have incinerated. Both typically apply their processes on energized transformers where the only restrictions are that the transformers have over 200 gallons of fluid and operate at 69,000 volts or lower. General Electric utilizes a dilution process of drain-flush-fill with 10-C transformer oil and repeat as necessary. After two repeats, the cost becomes almost as much as a new transformer so G.E. typically limits reclassification to transformers having 2,500 parts per million or less.

We understand and accept the UNISON retrofill technology. In each situation, however, there are many facets to consider. Among these are location of transformer; building or structure construction; age and condition of transformer; transformer service (ease of getting it de-energized); electrical system data which includes loading, primary and secondary protection, short circuit data, etc.; economics; indemnifications; and reclassification. Each transformer and risk management circumstance needs to be evaluated on its own merits.

3511N

DISTRIBUTION LIST

J. P. Alexander - Loc. 513
W. E. Ballard - Loc. 514
R. R. Bannister - 2000/4201
B. K. Barber - Loc. 515
W. H. Barton - Loc. 312
H. N. Baylor - 2000/1200
I. A. Blackwood - Loc. 509
T. O. Blum - Loc. 515
W. H. Boyd - Loc. 312
D. L. Brucker - Loc. 519
L. E. Calvert - Loc. 803
J. M. Cockrell - Loc. 306
T. L. Collins - 740/2320
R. A. Conway - 770/342
D. A. Dechman - 2000/4401
D. M. Dailey - 3001
F. E. Dailey - Loc. 380
J. F. Dodd - Loc. 514
J. M. Dufour - Loc. 503
R. M. Dunbar - Loc. 508
J. R. Gagnon - 2000/4229
R. E. Gardner - 2000/3201
D. L. Garrison - 2000/4201
H. V. Garrison - Loc. 526
J. M. Gaston - Washougal
P. D. Gossage - Loc. 514
S. Griffith - Loc. 510
D. L. Goris - Loc. 510
J. H. Graves - Loc. 510
S. Griffith - Loc. 510
H. M. Haggard - Loc. 510
R. E. Harris - Loc. 519
R. A. Hazlewood - Loc. 380
D. E. Heath - 2000/4401
S. E. Illikainen - Loc. 512
N. K. Johnston - 3001
P. R. Kavasmaneck - 2000/3235
R. W. Klein - Loc. 515
H. P. Krog - 740/4417
T. E. Liles - Loc. 510
W. G. G. Lindley - Loc. 508
R. G. Link - Loc. 514
W. W. Long - Loc. 526
M. E. Malone - Loc. 503
C. D. McFadden - Loc. 306
W. W. McManus - Loc. 526
R. G. Meadows - 2000/3201
R. W. Mealey - Loc. 306
J. C. Nelson - Moses Lake
C. C. Neely - 2000/3335
J. F. Odrcich - Loc. 509
G. F. Painter - Loc. 514
R. A. Payne - Loc. 512
L. W. Phair - Loc. 380
J. E. Pierce - Loc. 519
D. C. Price - Loc. 519
J. G. Principe - Loc. 503
F. S. Provenzano - Loc. 515
D. M. Rasmussen - 2000/2201
D. R. Reem - Loc. 515
A. Robertson - Loc. 508
D. L. Runyon - 2000/2335
R. Salavador - Loc. 509
R. A. Sander - Loc. 312
R. W. Scoular - 701/401
R. Shomo - Loc. 512
W. J. Simmons - Loc. 155
L. L. Simpson - 2000/4112
J. C. Steven - 3001
W. V. Summers, Jr. - Loc. 380
T. G. Swanson - Loc. 514
B. H. Thomas - 3001
P. Tock - Loc. 509
S. W. Turicchi - Loc. 0500
J. R. Turner - Loc. 508
G. A. Viera - 2000/4234
M. R. Villers - Loc. 512
P. A. Walden - Loc. 803
P. D. Wegrzynowicz - Loc. 312
F. W. Wyatt - 3001
R. T. Worrell - Loc. 803
B. J. Zoet - Loc. 306